INFORMATION REPORT

THE EFFECTS OF MANUAL PLANTATION CLEANING

Department of Forests, Mines and Energy
Timber Management Branch
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INTRODUCTION

The Timber Management Branch of the New Brunswick Department of Natural Resources initiated trials in the fall of 1982 and the summer and fall of 1983 to test the feasibility of motor-manually cleaning plantations to control undesirable species. Previous reports have described the methods used, compared costs and reported on initial responses of the vegetation (Plantation Tending Trials October 1982 and New Brunswick Plantation Cleaning Trials 1981, 1982, 1983). This report summarizes vegetation measurements on the areas in October 1984.

METHODS

Twenty-five plots were established in each cleaned area and in an adjacent uncleaned area. Plots were 60 cm in radius and had a planted tree as the center point. This method was used because one cleaning procedure (radius) was to cut all stems within 60 cm of the planted trees. At each plot the height and leader length of the planted tree was recorded as well as the number of stems and height of the tallest individual of each species within the plot.

RESULTS

Table 1 summarizes the results of the measurements. There was considerable variation, however, when all cleaned areas were compared with their control the planted trees in the cleaned area averaged 3.9 cm higher and had 2.6 cm more leader growth than in the control areas. The differences are statistically significant.

There were 1 300 stems per hectare less natural softwoods in the cleaned areas than in the control areas. There was no significant difference in height of the natural softwood between the cleaned and control areas.

The average density of hardwoods was 6 500 stems per hectare greater in the cleaned areas than in the control areas but the difference was not statistically significant. Field observations indicated resprouting of cut stems may be a problem. Hardwoods in the cleaned areas averaged 29 cm shorter than those in the control areas, a highly significant difference.

The average density of raspberries was 18 000 stems per hectare greater in the cleaned areas than in the control areas which statistically is slightly significant. Raspberries in the cleaned areas averaged 7 cm shorter than those in the control areas, a difference which is highly significant.

When comparing radius cleaning versus complete cleaning there were no significant differences either in the response of the planted trees or the natural vegetation except hardwoods in the radius cleaning areas were significantly taller than in the complete cleaning areas. No explanation for this is evident at present.

When comparing summer versus fall cleaning there were no significant differences except in natural hardwoods. One year after cleaning there were significantly fewer hardwoods (29 000 stems/ha) and they were significantly shorter (24cm) in areas cleaned in the summer than areas cleaned in the fall.

Cutting undesirable stems around planted trees has produced an increase in growth of the planted trees. However before motor manual cleaning can be recommended as an alternative to chemical weed control the longer term results must be considered. There is some indication of an increase in the number of hardwoods and raspberries in the cleaned areas. One or two years after cleaning they are shorter in the cleaned than in the uncleaned areas however as they grow the effects on the planted trees may be as great or greater than if the area had not been cleaned. It appears cleaning the entire area sets hardwoods back more than just cleaning a 60 cm radius around the planted trees. Cutting hardwoods in the summer sets them back more than cutting them in the fall.

Remeasurement will continue in the fall of 1985 to follow the response of the planted trees.

Table 1. Summary of fall 1984 measurements of plantations cleaned in 1982 and 1983. Density and height of natural regeneration was measured within 60 cm of the planted trees.

Location	Year Planted	Species Planted	Time Cleaned	Method	Planted Trees		Natural Softwood		Natural Hardwood		Raspberry	
					Height (cm)	Leader Length (cm)	Density Stems/ ha	Height (cm)	Density Stems/ ha	Height (cm)	Density Stems/ ha	Height (cm)
Anderson Rd.	TP-42-78	bS	Oct. 1982	Radius	82	21	0	-	34 000	51	120 000	41
		bS	Control	-	81	14	180	112	13 000	118	69 000	59
Browns Mtn	P-40-81	wS	Oct. 1982	Radius	34	10	0	-	26 000	67	160 000	56
		wS	Control		38	10	0	-	15 000	67	130 000	59
Dinnen Woods	TP-54-81	bS	Oct. 1982	Radius	21	9	530	25	21 000	56	280 000	64
			NO CONTROL AVAILABLE									
Biggar Bk	TP-59-79	bS	July 1983	Radius	116	28	1 100	30	11 000	46	210 000	59
		bS	Oct. 1983	Radius	117	28	1 100	63	44 000	94	130 000	54
		bS	July 1983	Complete	92	27	3 400	54	18 000	69	230 000	62
		bS	Oct. 1983	Complete	109	28	1 900	53	34 000	83	74 000	53
		bS	Control		95	24	2 300	170	13 000	132	110 000	63
Brown Rd	TP-12-80	bS	July 1983	Radius	62	21	7 100	24	17 000	62	210 000	38
		bS	Oct. 1983	Radius	47	13	2 400	40	23 000	83	160 000	59
		bS	July 1983	Complete	54	20	0	-	17 000	39	190 000	41
		bS	Oct. 1983	Complete	55	14	0	-	64 000	68	140 000	54
		bS	Control		59	17	3 900	85	35 000	99	160 000	50
Lunts Bk	P-42-80	bS	July 1983	Radius	58	16	1 300	10	22 000	82	250 000	61
		bS	Oct. 1983	Radius	76	24	3 700	18	36 000	104	210 000	56
		bS	July 1983	Complete	60	18	1 900	18	20 000	59	200 000	48
		bS	Oct. 1983	Complete	64	21	2 400	57	16 000	75	270 000	58
		bS	Control		58	15	7 100	13	13 000	77	240 000	65

Table 1. (cont'd)

Location	Year Planted	Species Planted	Time Cleaned	Method	Planted Trees		Natural Softwood		Natural Hardwood		Raspberry	
					Height (cm)	Leader Length (cm)	Density Stems/ ha	Height (cm)	Density Stems/ ha	Height (cm)	Density Stems/ ha	Height (cm)
Marrtown	TP-20-82	jP	July 1983	Radius	27	10	0	-	36 000	43	0	-
		jP	Oct. 1983	Radius	25	10	0	-	120 000	78	16 000	40
		jP	July 1983	Complete	29	12	0	-	85 000	40	15 000	36
		jP	Oct. 1983	Complete	25	11	0	-	120 000	43	0	-
			Control		26	10	200	4	87 000	72	2 700	56
Lunts Bk	P-35-80	bS & wS	Fall 1983	Radius	50	14	200	8	19 000	64	280 000	59
		bS & wS	Control		43	10	1 100	17	26 000	97	180 000	64
Pleasant Ridge	P-25-82	jP	Fall 1983	Radius	77	25	2 200	19	31 000	68	190 000	58
		jP	Control		62	20	1 200	26	39 000	127	270 000	67
Point Wolfe	P-16-80	wS	Fall 1983	Radius	66	18	0	-	60 000	70	280 000	68
		wS	Control		64	17	0	-	39 000	113	240 000	66
Caribou Bk	P-11-78		Fall 1983	Radius	79	20						
	FP-4-81 FP-3-82	bS	Fall 1983	Radius	36	10	900	28	52 000	56	99 000	50
	P-11-78		Control		80	17						
	FP-4-81 FP-3-82	bS	Control		31	8	2 700	48	37 000	117	100 000	57